

DISCUSSION OF THE AMENDMENTS

Claim 1 is currently amended.

Claim 2 was previously cancelled.

Claims 3, 4, 6-9, 11-20 and 22 were previously presented.

Claims 5 and 21 are cancelled without prejudice or disclaimer.

Claim 10 is original.

Upon entry of the amendments claims 1, 3, 4, 6-20 and 21 will be active.

The amendment to claim 1 is supported by claims 5 and 21 as previously presented.

No new matter has been added.

### REMARKS

The office rejected claims 1, 3-6, 9-17 and 21-22 under 35 U.S.C. § 103 (a) over the combination of Motani '542 (U.S. 4,990,542), Motani '033 (U.S. 5,317,033), Arai (U.S. 4,818,451), Tusim (U.S. 4,912,140), BASF EP (EP 0915127) and BASF WO (WO 98/51735). In addition, the office rejected claims 7, 8 and 18-20 under 35 U.S.C. § 103(a) over Motani '033, Motani '542, Arai, Tusim, BASF EP, BASF WO, and Wesselman (U.S. 4,585,825).

The office primarily relies on the two Motani references which describe an extrusion process where a polystyrene foam in the form of a plate having a thickness of 40 to 60 mm is obtained by extension of a blowing agent containing melt through a slit with a clearance of 2.0 mm (examples 1 in Motani '033 and Motani '542).

Applicants would like to reemphasize the distinction between an extrusion process and the disclosed bead molding process (claim 1 of the disclosure). These two different processes are described in the attached Polymeric Materials Encyclopedia, volume 4, chapter on foamed plastics, page 2558. The properties of foamed products obtained by these distinct methods are summarized in Table 11. Applicants note the board made by the extrusion process show a much higher compressive strength, flexural strength and lower water absorption than board molded from foam beads. In contrast hereto in the process of the present invention the melt is extruded through a plate with holes of diameter 1.0 mm and cut directly downstream of the die to give foam beads with bulk densities below 20 kg/m<sup>3</sup> (page 4, lines 23 to 25 and tables on page 5). This is not just a change in the shape of foam sheets, because it changes the foaming characteristics of the blowing agent containing polystyrene melt when exiting the die, specifically, the properties of the foam, also changes. Since the expansion ratio is different in different directions from the die, the cells are often deflected along in the direction of thickness (Motani '542, Col. 9, lines 50 to 58 and Fig. 1). Applicants note that this difference in Motani gives densities of the foam sheets in above 26 kg/m<sup>3</sup> (see '033 and '542 table 1).

In order to produce a foam board, pre-foamed particles (beads) have to be fused together in a mold. This process is described i.e. in Arai et al (US 4,818,451) and EP-A 915 127

paragraph [0049]. Because of the fusion of the pre-foamed particles, it is evident that the properties of such a particulate foam board have to be different from an extrusion foam board. That is, the two processes are distinct and give distinct products.

In order to achieve the recited densities extrusion foam board would have to be further expanded by heated air or steam as noted on page 1, line 19-25 of the specification (also see EP 665865, example 1, paragraph [0031] cited in the IDS). This is an added step which is avoided by the claimed process. These examples provide evidence that the recited bulk densities are not necessarily inherent in the Motani references.

In addition, Applicants note that none of the cited references teach or suggest the recited blowing agent composition. The office has noted that the Motani references utilize water in the resin formulation but the water is not added as a blowing agent but rather as a cell controlling agent for the foam sheet. The water is combined with particles such as talc, calcium carbonate and silica which actually absorb the water creating the cell size control agent. (see Motani '542, column 3, line 49 to column 5, line 12 and Motani '033, column 5, line 55 to column 6, line 4). The use of a water/particulate mixture as a cell control agent is quite distinct from using water and a solubilizer as a blowing agent.

Accordingly, the Motani references do not use water as a blowing agent in the described processes. Overall, the cited references do not teach or suggest the recited three component blowing agent which includes water and a solubilizer. In addition, none of the other cited references teach or suggest the recited three component blowing agent. Therefore, the claimed process would not have been rendered unpatentable under 35 U.S.C. § 103 (a) over the cited references.

Finally, claims 7, 8 and 18-20 are further distinct by the broad molecular weight distribution, which leads to foam beads with particularly low bulk densities (present invention page 2 lines 42 to page 3, line 10). This effect is demonstrated by the Examples 10 to 12 in comparison to Example 9. Wesselmann (US 4,585,825) does not relate to thermoplastic polymer

foams and does not give any indication, how the molecular weight distribution of the polymer affects the foaming process or any foam characteristics.

Therefore, Wesselman in combination with the other cited references does not teach or suggest all the recitations of the claimed process. Accordingly, claims 7, 8 and 18-20 would not have been obvious over the cited references.

For the reasons discussed above, Applicants respectfully request that the office withdraw the rejections of claims 1, 3, 4, 6-20 and 21 under 35 U.S.C. § 103(a) over the cited references.

In light of the above remarks Applicants submit the application is in condition for allowance. Favorable reconsideration is respectfully requested.

In the event the Examiner believes an interview might serve in any way to advance the prosecution of this application, the undersigned is available at the telephone number noted below.

The Office is authorized to charge any necessary fees to Deposit Account No. 22-0185.

Please charge our Credit Card in the amount of \$120.00 covering the fee set forth in 37 CFR 1.136(a). The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 22-0185, under Order No. 12810-00034-US.

Dated: June 25, 2008

Respectfully submitted,

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